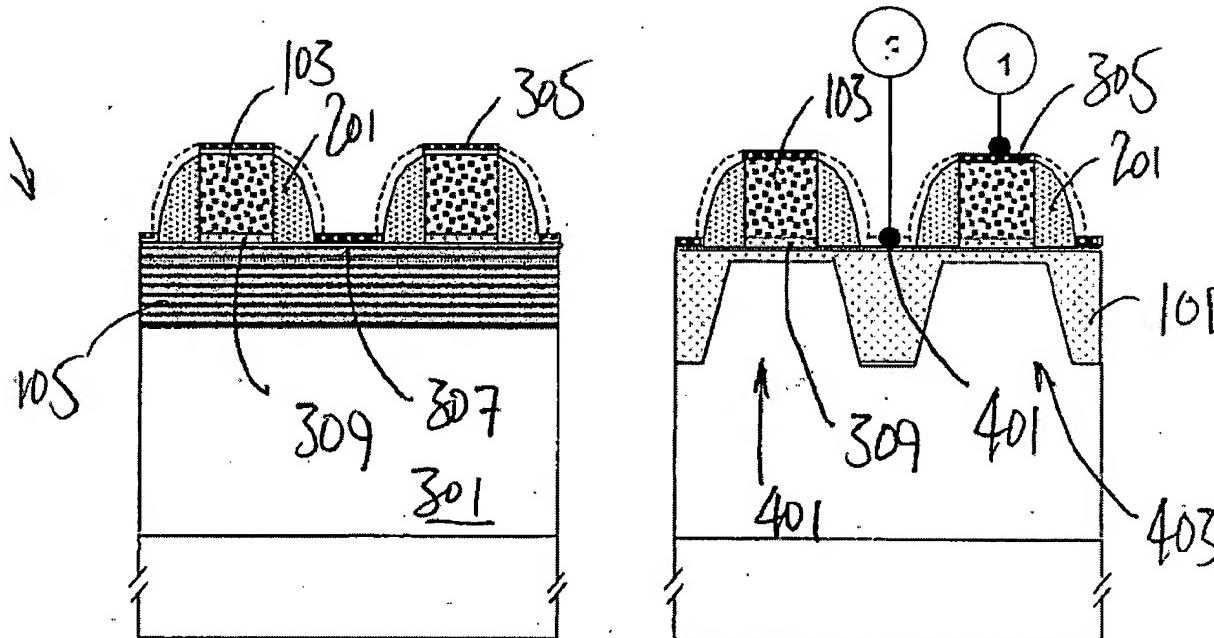


REMARKS/ARGUMENTS

No claims are amended, canceled, or added by entry of this response. Accordingly, following entry of these amendments and remarks, claims 1-10 will remain pending.

Embodiments in accordance with the present invention relate to a method and device for manufacturing semiconductor devices. As shown in Figures 3 and 4 (reproduced below), one feature of the claimed embodiments is formation of a trench isolation structure (101) and application of a refractory metal layer (305) over an exposed portion of the trench isolation structure (101).



Accordingly, claim 1 recites as follows

1. Method for manufacturing ROM memory devices, the method comprising:

forming a trench isolation structure within a cell region of a semiconductor substrate,

... applying a refractory metal layer overlying the gate structure including the first side wall spacer and the second sidewall spacer and exposed portion of the trench isolation structure;

alloying the refractory metal layer to the gate structure and exposed portions of source/drain regions to form silicided regions overlying the gate structure and source/drain regions; and. (Emphasis added)

In the latest Office Action, the Examiner rejected the pending claims as obvious based upon U.S. Patent No. 6,372,580 to Shiao ("the Shiao Patent") in view of U.S. Patent No. 6,847,087 to Yang et al. ("the Yang Patent"). These obviousness claim rejections are traversed as follows.

The Shiao Patent is the primary reference relied upon by the Examiner. Like the instant application, the Shiao Patent is directed to a method for manufacturing a semiconductor device and discloses formation of a thin refractory metal (See col. 4, lines 57-58). Unlike the instant application however, the Shiao Patent does not even contemplate the use of a trench isolation structure. Specifically, as conceded by the Examiner in the latest Office Action, the Shiao Patent fails to teach formation of a trench isolation structure within a cell or the arrangement of the isolation structure (See Office Action Mailed May x, 2007, page 4, lines 1-2).

In an effort to provide the teaching lacking from the Shiao Patent, the Examiner has combined that reference with the Yang Patent. However, the Examiner is respectfully reminded of a key requirement for establishing a *prima facie* case of obviousness:

there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (MPEP 2143).

Such teaching or suggestion to make the claimed combination must be found in the prior art, not in applicant's own disclosure. In re Vaeck, 947 F.2d 488 (Fed.Cir. 1991).

Here, there is absolutely no suggestion in the Shiao Patent that would motivate one of ordinary skill in the art to combine it with the Yang Patent. Specifically, an object of the Shiao Patent is the development of a silicide layer to reduce the electrical resistance in the word and bit lines.

Since the silicide layer is deposited in a single step, it can be easily incorporated into the manufacturing process. Furthermore, the suicide (silicide) layer reduces electrical resistance in both the word lines and bit lines resulting in improved operating speeds of the memory cells. (Emphasis added; col. 5, lines 17-21)

By contrast, as shown in Figure 2(a) (reproduced below) of the Yang Patent, this reference utilizes a contact plug (102) which penetrates the surface of the drain region and buried bit lines in order to short-circuit the drain and bit lines:

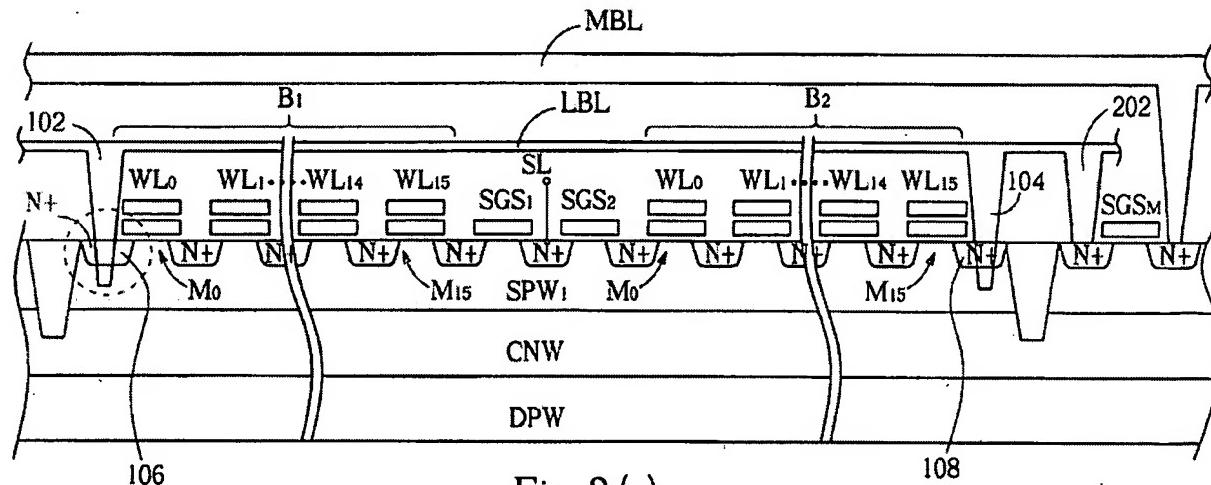


Fig. 2 (a)

contact plug 102 is electrically connected with a drain 106 of the NMOS memory transistor M₀ of the NAND cell block B₁. As specifically indicated in the circle regions of FIG 2(a), the contact plug 102 penetrates a junction of the drain 106 and the underlying buried bit line SPW₁, thereby short-circuiting the drain 106 and the subjacent buried bit line SPW₁. (Emphasis added, col. 5, lines 11-15)

Accordingly, use of the salicide process and the formation of a silicide layer as taught in the Shiau Patent, in combination with the Yang Patent, would be nonsensical since the silicide layer of the Shiau Patent is used to decrease electrical resistance of the drain and bit line region, while the contact plug of the Yang Patent is electrically coupled to short-circuit this region. In view of this, use of the contact plug of the Yang Patent is therefore inconsistent with the expressed objective of the Shiau Patent.

Based at least upon this key difference between the Shiau and Yang Patents, one of ordinary skill in the art would hardly have been motivated to combine these references to arrive at the claimed invention.

Of course, the instant application contains substantial disclosure regarding formation of a trench isolation structure and application of a refractory metal layer over an exposed portion of the trench isolation structure. However, the Examiner is respectfully reminded that any suggestion to combine references must be found in the prior art, and not be based upon applicants' own disclosure:

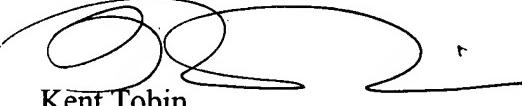
The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be

reached on the basis of the facts gleaned from the prior art. (Emphasis added; MPEP 2142)

In view of the failure of the Shiau and Yang Patents to provide any motivation for their combination, it is respectfully asserted that the pending claims cannot be considered obvious in light of these references. Resort by the Examiner to Applicants' own disclosure to provide motivation or suggestion for combination is strictly prohibited as impermissible hindsight. And as such, the instant obviousness rejections are improper and should be withdrawn.

Based upon the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,


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